Natural Heritage &
Endangered Species
Program

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Natural Community Fact Sheet
Rock Cliff Communities

Community description

Rock Cliff Communities all occur on a more or less vertical bedrock cliff faces. They have extremely sparse scattered vascular plants on ledges and in crevices. Lichens may be dense on the rock face.

Base of a Calcareous Rock Cliff, showing the exposure and plant growth at the bottom where nutrients and soil

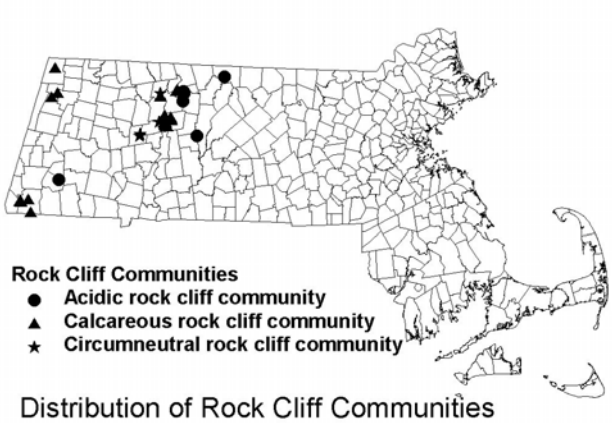
Environment

In Massachusetts, Rock Cliff Communities are on bedrock with little soil to hold water and nutrients. They may be open to the sun or partially to mostly shaded by surrounding forests. Rock Cliffs of conservation interest are usually very small patches in a larger forested matrix. They tend to be less dry than Rocky Summits and Outcrops because of protection from surrounding forests. In general, the surrounding forests are the types typical of the region, with oak or oak and pine dominating in the southern to central part of the state, and northern hardwoods or spruce to the north and in higher areas.

A Rock Cliff in a forested shaded situation. The appearance is typical of all types, although this example is a Circumneutral Rock Cliff. B.A. Sorrie, NHESP.

Rock Cliffs are often adjacent to topographically related features: a rock cliff may have a talus slope below it and a rocky ridgetop and open rock outcrops above it. The cliffs often include ledges that typically support more vegetation.

Three types of very sparsely vegetated plant communities have been identified on rock cliff faces, depending on the chemistry of the rock: Acidic, Circumneutral, and Calcareous (alkaline, named for calcium availability) Rock Cliff Communities occur throughout Massachusetts.



Distribution of Rock Cliff Communities in Massachusetts, 2007

Range:

Rock Cliffs occur throughout Massachusetts where there are bedrock hills. Acidic Rock Cliff Communities are considered to be relatively common (S4) in Massachusetts, so the Natural Heritage & Endangered Species Program (NHESP) keeps track of only very high quality examples of the community type: currently there are six examples in the NHESP database. Circumneutral and Calcareous Rock Cliff Communities are less common (S3): good to excellent examples of both are tracked. There are 17 examples of Calcareous Rock Cliff Communities in the database from Berkshire County and the Connecticut Valley. Three examples of Circumneutral Rock Cliffs are tracked in the Connecticut Valley.

Characteristic plant species in Massachusetts

Acidic Rock Cliff Communities are the least diverse of the group, and have the fewest specialized plant species. They support species of dry, low nutrient openings from the surrounding forests, such as Virginia Creeper (*Parthenocissus quinquefolia*), Common Polypody (*Polypodium virginianum*), and Rusty Cliff-fern (*Woodsia ilvensis*). Harebell (*Campanula rotundifolia*), and Fringed Bindweed (*Polygonum cilinode*) are often on acidic cliffs, as well as in other sterile acidic conditions.

Circumneutral Rock Cliff Communities also support species of dry open areas, including Pale Corydalis (*Corydalis sempervirens*), Plantain-leaved Pussytoes (*Antennaria plantaginifolia*), Columbine (*Aquilegia canadensis*), Marginal Wood-fern (*Dryopteris marginalis*), Ebony Spleenwort (*Asplenium platyneuron*), Rusty cliff-fern (*Woodsia ilvensis*), and mosses. Included with Circumneutral Rock Cliffs are sandstone cliffs and associated very steep sandstone derived slopes that support dry, grassy communities with scattered shrubs (glades). Red Cedar (*Juniperus virginiana*) is common on these areas.

Calcareous Rock Cliffs have vegetation that is more distinct and specific to the habitat. Purple Cliff brake (*Pellaea atropurpurea*), Bulblet Fern (*Cystopteris bulbifera*), Maidenhair Spleenwort (*Asplenium trichomanes*), Blunt-lobed Cliff-fern (*Woodsia obtusa*), and Columbine (*Aquilegia canadensis*) are characteristic of Calcareous Cliffs. Surrounding vegetation tends to be northern hardwood forest; sometimes Rich Mesic Forests occur below the cliffs where nutrients and moisture accumulate. Calcareous Rocky Summit/Rock Outcrop Communities may occur above the cliffs, although much calcareous rock in Massachusetts is overlain by more resistant acidic rock.

Characteristic animal species in Massachusetts

All types of cliffs provide nesting habitat for Ravens (*Corvus corax*). Peregrine Falcons (*Falco peregrinus)*(Endangered), released in urban areas since 1984, have only begun to return to nest on cliffs, their natural habitat. Cliffs were probably the native habitat of the Eastern Phoebe (*Sayornis phoebe*). No mammals, reptiles, or amphibians would be expected on the steep cliff faces, although they often inhabit adjacent rocky habitats.

Associated Rare Species

Aside from the Peregrine Falcons just returning to their natural cliff habitat, no state protected animals are known to have Rock Cliffs as a major part of their habitat. However several rare plant species do occur on the various types of Rock Cliffs:

Type of Cliff Community	Common Name	Scientific Name	State Rank
Acidic	Climbing Fumitory	*Adlumia fungosa*	SC
Acidic	Mountain Spleenwort	*Asplenium montanum*	E
Circumneutral	Linear-leaved Milkweed	*Asclepias verticillata*	T
Circumneutral	Wall-rue Spleenwort	*Asplenium ruta-muraria*	T
Circumneutral	Mountain Firmoss	*Huperzia appressa (= H. appalachiana)*	WL
Circumneutral	Michaux's Sandwort	*Minuartia michauxii*	T
Circumneutral	Purple Cliff-brake	*Pellaea atropurpurea*	WL
Circumneutral	Rock Knotweed	*Polygonum tenue*	WL
Circumneutral	Tiny-flowered Buttercup	*Ranunculus micranthus*	E
Circumneutral	Rock Spikemoss	*Selaginella rupestris*	WL
Circumneutral	Snowberry	*Symphoricarpos albus* var. *albus*	E
Calcareous	Roundleaf Shadbush	*Amelanchier sanguinea*	SC
Calcareous	Smooth Rock-cress	*Boechera (*was *Arabis) laevigata*	T
Calcareous	Lyre-leaved Rock-cress	*Aradopsis (*was *Arabis) lyrata*	E
Calcareous	Wall-rue Spleenwort	*Asplenium ruta-muraria*	T
Calcareous	Fragile Rock-brake	*Cryptogramma stelleri*	E
Calcareous	Rock Pellitory	*Parietaria pensylvanica*	WL

Protected under the Massachusetts Endangered Species Act: SC=State Special Concern, T=State Threatened, E=State Endangered and WL=Watch List (not regulated)

Threats and Management Recommendations

The number of nesting pairs of Peregrines has rebounded in Massachusetts over the past decades (thirteen pairs in 2007). Natural nest sites may still be re-colonized in the future as the numbers reach historic levels. However, at some cliff sites, it is likely that rock-climbers disturb prospecting pairs of falcons sufficiently to keep the birds from nesting, either just for that season or as a possible nest site at all. Ridgetops and rock cliffs often have human trails running along their summits. Increasingly, these trails are used, not just by hikers, but also by riders of mountain bikes, off-road vehicles, and snowmobiles, all of which cause greater erosion of the trails than hikers. Beyond these obvious threats of human use, hikers can trample vegetation on delicate cliff tops, destroying rare plants or the larval food plants for rare moths of these areas.

The other major threat to rocky areas in Massachusetts is quarrying. Several types of quarrying are likely to destroy Rock Cliff habitat: basalt (traprock) quarries on the ridges of the Connecticut River valley; limestone and marble quarries in the Berkshires; and granite quarries in many part of the state, from the Boston suburbs westward. When quarries are abandoned, the area may eventually revert to habitat suitable for rare animals and plants, but more often, quarries leave flattened areas bare of all but planted grass and invasive weeds – land which is ripe for residential or commercial development, despite the costs of building on rock.